

What's New in Dentistry

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Guided bone regeneration negatively affected by nicotine. Guided bone regeneration is routinely used to eliminate certain types of crestal alveolar bone defects in adult periodontal patients. Research over the past 10 years has shown that the use of membranes made from polytetrafluoroethylene (nonresorbable) and poly-L-lactic acid (resorbable) are effective at regenerating attachment and bone adjacent to teeth with specific periodontal defects. However, some patients with periodontal disease smoke cigarettes. Nicotine has been shown to contribute to the severity of periodontal disease. A study published in the *Journal of Periodontology* (2004;75:565–571) evaluated the effect of nicotine on bone regeneration of periodontal defects in laboratory animals. The sample consisted of 16 animals. Bilateral periodontal defects were created adjacent to posterior teeth in each animal. One side served as the control and received no further surgical intervention. On the other side, a polytetrafluoroethylene membrane was placed over the defect to enhance bone regeneration. Then, in half of the animals, nicotine was injected subcutaneously twice daily for four months. The other group received no nicotine. After four months, the periodontal defects were re-evaluated to determine the effect of the nicotine on bone regeneration. The authors found that the membrane-protected defects in the control group demonstrated an increased bone area compared with membrane-protected defects in the nicotine group. In addition, nicotine administration significantly affected bone density in membrane-protected and non-membrane-protected sites. This study concludes that nicotine does not prevent, but negatively affects, bone healing in alveolar defects treated by guided bone regeneration.

Placement of tetracycline compound after third molar extraction does not prevent dry socket. Dry socket, or alveolitis sicca, is one of the most frequent complications of impacted mandibular third molar surgery. This side effect manifests as an intense pain in the extraction site that begins on the third to fifth postoperative day. A study published in the *Journal of Oral and Maxillofacial Surgery* (2004;62:587–591) evaluated the incidence of dry socket after placing an intra-alveolar tetracycline compound in the third molar extraction socket immediately after surgery. The sample for this study consisted of 200 patients with impacted mandibular third molars. The sample was divided into two groups. In one group, a pharmacologic preparation was placed in the postextraction socket consisting of nine

mg of tetracycline hydrochloride (antibiotic), 12 mg of tetracaine hydrochloride (analgesic), six mg of antipyrine (analgesic, antipyretic), and 20 units of fungal protease (proteolytic enzymes). The other group received no compound in the extraction socket. The patients then rated postoperative pain at two, six, and 12 hours after extraction and then every day for the first six postoperative days based on a visual analog scale from 0 to 10. Dry socket was determined by increased severity of pain and loss of the blood clot in the days following extraction. The results showed that the greatest pain appeared after six hours, and maximum inflammation occurred one day after third molar extraction. The incidence of dry socket was 3% among the patients who were administered the tetracycline compound and 1% among the patients who received no such treatment. On the basis of their data, the authors believe that intra-alveolar tetracycline placement is not indicated to prevent dry socket or the pain and inflammation after mandibular third molar extraction.

Dental radiography during pregnancy associated with low infant birth weight. Past research has shown that in prepubertal females, high-dose therapeutic radiation for childhood cancers has been associated with an increased risk for future low-birth-weight offspring, and a direct relationship has been reported between the radiation dose and low-birth-weight risk. In pregnant women, medical x-ray radiation also has been associated with an increased low-birth-weight risk. What about exposure to dental x-ray radiation during pregnancy? A study published in the *Journal of the American Medical Association* (2004;291:1987–1993) investigated the relationship between antepartum dental radiography and infant low birth weight. The sample consisted of enrollees in a dental insurance plan with live single births between January 1993 and December 2000. The authors identified a sample of 1117 women with low-birth-weight infants. The sample was further subdivided to relate the gestational period with the birth weight in order to adequately compare preterm and full-term infants. Then, because the dental care of each of these pregnant women was covered by the same insurance carrier, the researchers could determine the number and types of radiographs taken on each of these women during their pregnancies. They then calculated the dosage of radiation received by these women during their pregnancies. A control sample of 4468 normal-birth-weight infants was selected as a control group.

When these researchers compared the radiation exposure of both groups, they found that dental radiation exposures were more common among women with low-birth-weight infants than among women with normal-birth-weight infants. These researchers conclude that dental radiography during pregnancy is associated with low birth weight, specifically with term low birth weight.

Regenerative periodontal therapy enhances long-term tooth survival. Guided tissue regeneration is a common method of correcting attachment loss in adult periodontal patients. Although many studies have reported successful regeneration of periodontal attachment, few studies have followed these patients long term to determine the impact of guided tissue regeneration on tooth survival. In a study published in the *Journal of Periodontology* (2004;75:672–678), the authors performed guided tissue regeneration and then evaluated the patients up to 16 years postoperatively to determine the efficacy of this type of treatment. Their sample consisted of 175 patients with one deep intrabony defect who had been treated with guided tissue regeneration and had received full periodontal examinations every two years for up to 16 years. The authors evaluated tooth survival and measured the clinical attachment levels over time. The results of this study show that tooth survival for the teeth that received guided tissue regeneration was greater than 96% more than 10 years after surgery. The clinical attachment level was equal to or coronal with respect to pretreatment levels in 92% of sites followed for 15 years after treatment. On the basis of their data, and within the limits of this study, the authors believe that the data suggest that tooth retention and clinical improvements following guided tissue regeneration of intrabony defects can be maintained long term in the majority of cases.

Cemented versus screw-retained implant-supported single-tooth crowns. Implants have become a common choice for replacing missing teeth. After an implant has integrated with the bone, a crown must be attached to the implant. The crown may either be cemented or retained with a screw. Although there are restorative advantages for each of these approaches, are there any long-term differences with respect to the peri-implant bone levels, peri-implant soft tissue parameters, or the incidence of prosthetic complications when the implant crown is cemented versus screw-retained? This question was addressed in a study published in the *International Journal of Oral and Maxillofacial Implants* (2004;19:260–265). The sample consisted of 12 consecutive patients selected from a patient population attending the Implantology Department at a major European university. All individuals had bilateral single-tooth edentulous sites in the canine/premolar/molar region, with adequate bone width and similar bone height at the implant sites. Each patient received two identical implants (one in each edentulous site). One implant was randomly selected to be restored with a cemented crown, and the other was restored with a screw-retained crown. The peri-implant marginal bone levels and soft tissue parameters were collected four years after implant placement to determine any differences between the two methods of securing the crowns to the implants. All 24 implants survived, and there were no differences in the peri-implant bone levels or the peri-implant soft tissue parameters between the cemented and screw-retained crowns. The authors conclude that within the limitations of their study, either method of securing the crown to the implant will produce equivocal bone and soft tissue responses adjacent to the implant.